

CRUISE REPORT

Cruise Number: MF04-04

Vessel: NOAA Ship Miller Freeman

Area of Operations: Gulf of Alaska, Shelikof Strait, and Bering Sea

Itinerary: Depart Kodiak, Alaska: 9 April 2004
 Arrive Dutch Harbor, Alaska: 22 April 2004

Participating Organizations: NOAA/PMEL/FOCI

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Stephen Smith	M	USA	NOAA/PMEL
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Jennifer Key	F	USA	Central WA University
Stephen Slaughter	M	USA	Central WA University
Laura Brezinsky	F	USA	Teacher at sea

Cruise Objectives: The primary objective of the cruise was the recovery and deployment of moorings in the Gulf of Alaska and Bering Sea. The second objective was physical oceanographic property sampling at and near the mooring locations.

Summary of Operations and Samples Collected:

CTD Casts	58
Moorings Recovered	22
Moorings Deployed	14
Salinity Samples	53
Chlorophyll Samples	145
Nutrient Samples	202
ARGOS Satellite-tracked drifters	10
APEX drifter	1

Cruise Summary:

On April 1st as NOAA Ship MILLER FREEMAN was headed into Sitkalidak Strait to do some equipment testing, the ship struck a reef at the entrance to Sitkalidak Strait. Three days were lost from MF04-04 in order to determine the extent of damage to the ship and certify that the ship was still safe to sail until repairs could be made. In addition, mooring operations were impacted by the loss of the centerboard transducer during the grounding.

Adverse weather caused a departure delay from the afternoon of April 8th to the morning of April 9th. Once underway from the U.S. Coast Guard Base in Kodiak, Alaska, NOAA Ship MILLER FREEMAN proceeded to the Chiniak Bay mooring site. A CTD, mooring recovery, mooring deployment and second CTD were completed.

Due to a combination of the delayed departure and timing issues, the originally scheduled marine mammal mooring recovery was canceled. The ship proceeded from Chiniak Bay to GLOBEC mooring site 12. A CTD, mooring recovery, mooring deployment and second CTD were completed. The next mooring site, GLOBEC mooring site 5, was also completed as planned – consisting of a CTD, mooring recovery, mooring deployment, second CTD, and ARGOS drifter deployment.

At mooring site 4, a CTD was completed. During the mooring recovery attempt the release indicated that it was in a horizontal position; the mooring was not recovered. The following are from Bill Floering's notes about site 4: "Benthos release No. 969. 5 Pings back on range after enable, no doubt it is laying flat on the ocean bottom. Tried several release commands from several angles around the release. Ranges were variable so difficult to triangulate a good location on this release. In an e mail from Bill Parker I learned that a 41 inch and 30 inch float plus two instruments from this mooring have been found in the Halo Bay area near Shelikof Straits." GLOBEC mooring 4 was deployed, a CTD completed, and an ARGOS drifter deployed.

We then proceeded to the site of an eddy where an APEX drifter and an ARGOS drifter were deployed.

At mooring site 3, a CTD, subsurface ADCP mooring recovery, surface mooring deployment, subsurface ADCP mooring deployment, and CTD were completed. The following are from Bill Floering's notes about the subsurface ADCP mooring recovery at site 3: "Benthos release No. 1087. This mooring was recovered successfully but came up with an old knot and tangle. The wire was partially cut/broken (rusty, not a fresh cut) but was knotted on its self. It appears the knot took the strain during deployment instead of the partially cut wire. I have no way of knowing if this particular problem is at all related to the other failures on the Globec line but include this for consideration. The knot was higher on the mooring than where the others have been breaking and it's a 75 Khz ADCP mooring with different floatation and instrumentation." The following are from Bill Floering's notes about the surface mooring at site 3: "This is the surface mooring that broke loose in late Jan., early Feb. It was located on a beach near Kodiak but by the time we were able to attempt a recovery on the charter vessel BIG VALLEY the entire surface package had been destroyed by the surf and the rocks. The stainless steel bridle and a

section of the larger chain attached to the bridle were buried under boulders. Only a single leg support ring from the aluminum buoy tower was found on the beach. The rest of the tower and associated instruments were gone. On 11 April we located the release at the original charted mooring location, EG&G release No. 016894. I fired the release command and disabled the release before moving on so it should be free from the anchor when we have a chance to recover it.” During the night, we backtracked to site 12 and deployed an ARGOS drifter.

At mooring site 2 a CTD was completed. The mooring recovery attempt was not successful. The following are from Bill Floering’s notes about site 2: “5 pings back on enable/range. Tried several release commands but no luck. Benthos release No.1073 will not give consistent ranges. We tried 2 grapple-hook drags, making an X across the charted deployment location with no success. Release is lying flat on the ocean bottom.” GLOBEC mooring 2 was deployed, a CTD completed, and an ARGOS drifter deployed.

At mooring site 1 a CTD was completed. The mooring recovery attempt was not successful. The following are from Bill Floering’s notes about site 1: “An EG&G release No. 015981. Fired the release and received a confirmation on release but the mooring did not surface. Ranges are good right over the top of the charted position so it’s obviously still there. This is an older EG&G that does not have a separate reply when the release is horizontal. We tried one lasso circle drag but no success.” GLOBEC mooring 1 was deployed, a CTD completed, and an ARGOS drifter deployed.

At Gore Point, the three mooring sites were successfully completed – each consisting of a CTD, mooring recovery, mooring deployment, and a second CTD.

At Shelikof Strait, sites 1 and 3 were successfully completed - each consisting of a CTD, mooring recovery, mooring deployment, and a second CTD. We did not recover the mooring at site 2 – the middle site – and were therefore unable to deploy a mooring at site 2 due to lack of equipment. . The following are from Bill Floering’s notes about Shelikof Strait site 2: “Benthos release No. 1061. Release appears to enable but the ranges are all over the map. No indication that the release is horizontal but does not range well, release or disable. Because I have observed this problem before and there was a discussion with EDD about possible circuit confusion inside the release we decided to let the release sit for 12 hours and allow it to automatically turn off. After completing the line 8 CTD series we came back to this mooring for a second attempt. Again the release appears to enable and is vertical. Ranges are not reliable and it would not release. We attempted one circle lasso drag with no success. There was some confusion on the bridge as to where the ship should remain when hauling back the wire. Had instructions been followed more closely we may have had a better chance of a recovery with the dragging operation. Due to time constraints we were unable to attempt a second drag.” As mentioned in Floering’s notes, line 8 CTDs were completed during the night.

At Pavlof Bay, the mooring operations were successfully completed – consisting of a CTD, mooring recovery, mooring deployment, and a second CTD.

An ARGOS drifter was deployed in Unimak Pass on our way to Amukta Pass. The weather deteriorated as we made our way west. In the early afternoon, we determined that the weather

had moderated enough for mooring operations to proceed. We were able to recover all four moorings. Because another storm was predicted, the CTDs prior to mooring recoveries were canceled. After mooring recovery operations were completed, CTDs were taken at each of the mooring sites.

At our deepest mooring site in the Alaska Stream, we were unable to recover the mooring. The following are from Bill Floering's notes about 03GSP-9A: "Benthos 865A number 1007. Tried pinging on this mooring on two separate occasions for a minimum of 3 hours. Several passes over the charted mooring deployment site were made using an 8011A Benthos modified deck set. On each drift a combination of high, medium and low deck unit output power were used along with the variations in frequency from the published number to one half the number and two times the number for the enable and release commands. There was no response from the release using the range command or the release command." A drifter was deployed at the mooring site. The three remaining moorings in the Alaska Stream were recovered without incident. CTDs were conducted at each of the mooring sites (prior to recovery) and along a line going inshore at sites where the depth was 350m, 120m and 50m. Our last ARGOS drifter was deployed at the 120m CTD site.

We proceeded to Samalga Pass site 5. Due to strong currents, we were unable to recover the mooring, but felt confident that we would be able to recover the mooring the next day. We then proceeded to Samalga site 2. Due to waning light conditions, we recovered the mooring prior to completing the CTD. During the night, we completed six CTDs (four across the pass). In the morning, we recovered site 5, site 1 and site 3. The mooring at site 4 was not recovered – no response was received from the release.

At Bering Sea site 6, a CTD was completed and a mooring was recovered.

Summary of Cruise:

Days lost to weather – 1

Days lost to equipment failure – 0

Days lost to vessel repair/inspection – 2

(NOTE: one day extra added to end of cruise)

Acknowledgments:

Captain John Herring and his crew were extremely supportive of scientific operations. Their positive attitude and diligence during adverse weather conditions is admirable. Special thanks to ET Gary McMurrin for his help with Seacat repairs.

Attachments:**Table 1: Cruise Summary MF04-04**

Date (GMT)	Time (GMT)	Button	Notes	LATITUDE	LONGITUDE
4/9/2004	17:43:32	CTD at Depth	CTD001 (03CB-1B)	5742.8662N	15218.0530W
4/9/2004	18:12:06	Mooring Recover	03CB-1B	5743.4539N	15218.1863W
4/9/2004	20:02:50	Mooring Deploy	04CB-1A	5743.3300N	15217.6260W
4/9/2004	20:52:54	CTD at Depth	CTD002 (04CB-1A)	5743.5328N	15218.3098W
4/10/2004	14:38:55	CTD at Depth	CTD003 (03GBP-12B)	5841.0570N	14850.3412W
4/10/2004	15:47:43	Mooring Recover	03GBP-12B	5841.0042N	14850.6723W
4/10/2004	17:17:21	Mooring Deploy	04GBP-12A	5841.0108N	14850.8526W
4/10/2004	17:36:48	CTD at Depth	CTD004 (04GBP-12A)	5840.4231N	14850.6043W
4/10/2004	19:53:33	CTD at Depth	CTD005 (03GBP-5B)	5902.3654N	14842.3910W
4/10/2004	20:32:00	Mooring Recover	03GBP-5B	5902.5298N	14841.8758W
4/10/2004	22:15:51	Mooring Deploy	04GBP-5A	5902.5470N	14841.6086W
4/10/2004	22:33:12	CTD at Depth	CTD006	5902.2608N	14842.1651W
4/10/2004	23:06:10	CTD at Depth	CTD007 (04GBP-5A)	5902.3159N	14841.7126W
4/10/2004	23:21:22	Drifter Deploy	ARGOS ID 43704 (04GBP-5A)	5902.3678N	14842.4806W
4/11/2004	0:09:57	CTD at Depth	CTD008 (03GB-4B - mooring not recovered)	5907.8370N	14845.0531W
4/11/2004	4:52:06	Mooring Deploy	04GB-4A	5907.1747N	14845.3963W
4/11/2004	5:10:10	CTD at Depth	CTD009 (04GB-4A)	5906.9036N	14844.9113W
4/11/2004	5:27:21	Drifter Deploy	ARGOS ID 43708 (04GB-4A)	5906.6285N	14844.0455W
4/11/2004	12:12:01	Apex Deploy	APEX DRIFTER (deployed in eddy)	5817.9526N	14623.9764W
4/11/2004	12:19:56	Drifter Deploy	ARGOS ID 43707 (deployed in eddy)	5817.7199N	14623.7670W
4/11/2004	22:32:00	CTD at Depth	CTD010 (03GBP-3B)	5917.0409N	14856.8973W
4/12/2004	0:06:34	Mooring Recover	03GBP-3B	5917.0936N	14858.2937W
4/12/2004	4:00:24	Mooring Deploy	04GBM-3A (OSCAR)	5918.4932N	14859.7534W
4/12/2004	4:29:25	CTD at Depth	CTD011 (04GBM-3A)	5918.9664N	14859.6152W
4/12/2004	6:14:11	Mooring Deploy	04GBP-3A	5917.0266N	14857.5404W
4/12/2004	6:37:03	CTD at Depth	CTD012 (04GBP-3A)	5917.4333N	14857.5937W
4/12/2004	6:48:53	Drifter Deploy	ARGOS ID 43737 (04GBP-3A)	5917.3443N	14857.1520W
4/12/2004	9:47:57	Drifter Deploy	ARGOS ID 43733 (04GBP-12A)	5841.2481N	14850.8319W
4/12/2004	14:47:57	CTD at Depth	CTD013 (03GB-2B - mooring not recovered)	5931.8376N	14910.2849W
4/12/2004	21:36:13	Mooring Deploy	04GB-2B	5931.7223N	14911.3335W
4/12/2004	22:00:37	CTD at Depth	CTD014 (04GB-2B)	5932.2277N	14911.3533W
4/12/2004	22:15:37	Drifter Deploy	ARGOS ID 43703 (04GB-2B)	5932.3465N	14911.6113W
4/12/2004	23:31:11	CTD at Depth	CTD015 (03GB-1B - mooring not recovered)	5941.7456N	14920.9273W

May 12, 2004

Date (GMT)	Time (GMT)	Button	Notes	LATITUDE	LONGITUDE
4/13/2004	5:09:30	Mooring Deploy	04GB-1A	5942.7526N	14920.3432W
4/13/2004	5:30:21	CTD at Depth	CTD016 (04GB-1A)	5943.1593N	14920.0431W
4/13/2004	6:22:20	Drifter Deploy	ARGOS ID 43735 (04GB-1A)	5938.8490N	14924.2187W
4/13/2004	6:26:39	Drifter Deploy	LAST DRIFTER WAS ACTUALLY DEPLOYED AT 59 42.09 AND 149 19.44 AT 2203 TIME	5938.1068N	14925.5152W
4/13/2004	14:16:29	CTD at Depth	CTD017 (03GB-32B)	5905.5521N	15059.0819W
4/13/2004	15:35:06	CTD at Depth	CTD018 (03GB-32B - chlorophyll only)	5905.6757N	15100.1782W
4/13/2004	16:24:00	Mooring Recover	NO MARK FOR 03GP-32B		
4/13/2004	18:58:56	Mooring Deploy	04GP-32A	5906.0265N	15059.3879W
4/13/2004	19:16:42	CTD at Depth	CTD019 (04GP-32A)	5905.8037N	15058.8596W
4/13/2004	20:31:48	CTD at Depth	CTD020 (03GP-34B)	5857.9196N	15056.3012W
4/13/2004	20:57:00	Mooring Recover	NO MARK FOR 03GP-34B		
4/13/2004	23:03:50	Mooring Deploy	04GP-34A	5857.7752N	15055.9948W
4/13/2004	23:24:02	CTD at Depth	CTD021 (04GP-34A)	5858.1482N	15057.0107W
4/14/2004	0:50:55	CTD at Depth	CTD022 (03GPP-36B)	5844.8274N	15051.4387W
4/14/2004	1:40:06	Mooring Recover	03GPP-36B	5844.9255N	15052.0294W
4/14/2004	3:13:40	Mooring Deploy	04GPP-36A	5845.0165N	15052.0421W
4/14/2004	3:33:30	CTD at Depth	CTD023 (04GPP-36A)	5845.3531N	15053.1760W
4/14/2004	16:43:27	CTD at Depth	CTD024 (03SSP-1B)	5740.4670N	15512.3825W
4/14/2004	17:14:29	Mooring Recover	03SSP-1B	5741.2613N	15512.0555W
4/14/2004	18:55:06	Mooring Deploy	04SSP-1A	5741.0501N	15512.2018W
4/14/2004	19:17:05	CTD at Depth	CTD025 (04SSP-1A)	5740.4678N	15512.3293W
4/14/2004	20:15:26	CTD at Depth	CTD026 (03SSP-2B - mooring not recovered or deployed)	5737.4015N	15504.5618W
4/14/2004	23:00:55	CTD at Depth	CTD027 (03SSP-3B)	5729.2542N	15448.6817W
4/14/2004	23:22:00	Mooring Recover	NO MARK FOR 03SSP-3B		
4/15/2004	0:29:54	Mooring Deploy	04SSP-3A	5729.0132N	15448.4625W
4/15/2004	1:02:16	CTD at Depth	CTD028 (04SSP-3B)	5729.5512N	15449.0611W
4/15/2004	1:50:20	CTD at Depth	CTD029 (LINE 8, STA 55)	5728.3769N	15442.3927W
4/15/2004	2:33:47	CTD at Depth	CTD030 (LINE 8, STA 56)	5730.8853N	15447.0374W
4/15/2004	3:21:01	CTD at Depth	CTD031 (LINE 8, STA 57)	5732.9715N	15452.9727W
4/15/2004	4:18:30	CTD at Depth	CTD032 (LINE 8, STA 58)	5736.4439N	15500.5130W
4/15/2004	5:03:46	CTD at Depth	CTD033 (LINE 8, STA 59)	5738.7790N	15504.0043W
4/15/2004	5:57:26	CTD at Depth	CTD034 (LINE 8, STA 60)	5740.8855N	15510.0760W
4/15/2004	6:58:09	CTD at Depth	CTD035 (LINE 8, STA 61)	5743.1090N	15515.0865W
4/16/2004	20:27:14	CTD at Depth	CTD036 (03PA-1A)	5511.0350N	16141.7205W
4/16/2004	21:03:09	Mooring Recover	03-PAVLOF	5510.8738N	16141.3123W
4/16/2004	22:15:41	Mooring Deploy	04PA-1A	5510.8716N	16141.2011W

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Date (GMT)	Time (GMT)	Button	Notes	LATITUDE	LONGITUDE
4/16/2004	22:27:30	CTD at Depth	CTD037 (04PA-1A)	5510.6237N	16141.5878W
4/17/2004	11:27:01	Drifter Deploy	ARGOS ID 43736 (UNIMAK PASS)	5426.3661N	16527.1990W
4/17/2004	19:58:19	Notes		5342.5922N	16756.2379W
4/18/2004	22:10:51	Mooring Recover	03AMP-1B	5226.0770N	17127.6867W
4/18/2004	23:25:47	Mooring Recover	03AMP-2B	5225.1907N	17140.1786W
4/19/2004	1:10:50	Mooring Recover	03AMP-3B	5224.5714N	17154.9941W
4/19/2004	2:48:43	Mooring Recover	03AMP-4B	5223.4509N	17207.1863W
4/19/2004	3:28:54	CTD at Depth	CTD038 (03AMP-4B)	5223.4025N	17207.3373W
4/19/2004	4:31:30	CTD at Depth	CTD039 (03AMP-3B)	5224.2072N	17154.5725W
4/19/2004	5:43:19	CTD at Depth	CTD040 (03AMP-2B)	5225.1885N	17140.0851W
4/19/2004	6:57:12	CTD at Depth	CTD041 (03AMP-1B)	5225.8919N	17127.2544W
4/19/2004	18:22:48	CTD at Depth	CTD042-CTD FAILED DUE TO WIRE CONNECTION PROBLEMS	5210.8522N	16813.3239W
4/19/2004	18:25:44	Notes or Others	700 METERS OF WIRE OUT ON CTD 42 WHEN CANCELLED	5210.8588N	16813.4830W
4/19/2004	19:30:07	CTD at Depth	CTD042A (03GSP-9A - mooring not recovered)	5210.4676N	16811.6962W
4/19/2004	21:38:02	Drifter Deploy	ARGOS ID 43729 (03GSP-9A)	5210.0756N	16812.4660W
4/20/2004	0:01:53	CTD at Depth	CTD043 (03GSP-8A)	5223.3589N	16826.6920W
4/20/2004	4:25:26	Mooring Recover	03GSP-8A	5225.1140N	16833.4455W
4/20/2004	6:07:27	CTD at Depth	CTD044 (03GSP-7A)	5232.2957N	16837.0953W
4/20/2004	8:18:24	CTD at Depth	CTD045 (03GSP-6A)	5240.3196N	16848.2302W
4/20/2004	9:38:02	CTD at Depth	CTD046	5242.3792N	16850.6808W
4/20/2004	10:21:27	CTD at Depth	CTD047	5243.3012N	16850.8589W
4/20/2004	10:42:47	Drifter Deploy	ARGOS ID 43738 (inshore Alaska Stream line)	5243.6691N	16851.3543W
4/20/2004	11:26:20	CTD at Depth	CTD048	5247.9663N	16855.9505W
4/20/2004	22:12:55	Mooring Recover	03GSP-7A	5234.0759N	16835.0886W
4/21/2004	1:57:05	Mooring Recover	03GSP-6A	5240.0601N	16848.3000W
4/21/2004	6:03:31	Mooring Recover	03SG-2A	5301.8161N	16932.2617W
4/21/2004	6:20:58	CTD at Depth	CTD049 (03SG-2A)	5301.6916N	16932.5213W
4/21/2004	8:09:43	CTD at Depth	CTD050	5305.4518N	16859.2747W
4/21/2004	9:15:49	CTD at Depth	CTD051	5259.3576N	16908.6907W
4/21/2004	11:31:29	CTD at Depth	CTD052 (eastern site on Samalga Pass line)	5251.3317N	16923.2836W
4/21/2004	12:22:47	CTD at Depth	CTD053 (03SGP-1B/mideastern site on Samalga Pass line)	5250.9195N	16928.2123W
4/21/2004	13:03:29	CTD at Depth	CTD054 (midwestern site on Samalga Pass line)	5250.5444N	16933.0566W
4/21/2004	13:39:52	CTD at Depth	CTD055 (western site on Samalga Pass line)	5250.9035N	16937.9694W
4/21/2004	16:57:58	Mooring Recover	03SG-5B	5243.4829N	16923.2050W
4/21/2004	17:12:01	CTD at Depth	CTD056 (03SG-5B)	5243.4522N	16923.2951W

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Date (GMT)	Time (GMT)	Button	Notes	LATITUDE	LONGITUDE
4/21/2004	18:12:20	Mooring Recover	03SGP-1B	5250.7266N	16927.2688W
4/21/2004	19:59:11	CTD at Depth	CTD057	5301.0356N	16900.1552W
4/21/2004	20:09:00	Mooring Recover	NO MARK FOR 03SG-3B		
4/21/2004	22:40:10	CTD at Depth	CTD058 (03BSP-6A)	5323.9869N	16850.5353W
4/22/2004	0:09:01	Mooring Recover	03BSP-6A	5323.4879N	16852.4844W

Figure 1: Station Map

